

3. Completing the Square

$$4x^2 - 16x - 9 = 0$$

$$4x^2 - 16x - 9 + 9 = 0 + 9$$

$$\frac{4x^2 - 16x}{4} = \frac{9}{4}$$

$$x^2 - 4x + (-2)^2 = \frac{9}{4} - (-2)^2$$

$$(x - 4)^2 = \frac{9}{4} + \frac{4 \times 4}{1 \times 4}$$

$$(x - 4)^2 = \frac{9}{4} + \frac{16}{4}$$

$$(x - 4)^2 = \frac{25}{4}$$

$$\sqrt{(x - 4)^2} = \sqrt{\frac{25}{4}}$$

$$x - 4 + 4 = 4 \pm \frac{5}{2}$$

$$\therefore x = \frac{9}{2} \quad \text{or} \quad -\frac{1}{2}$$

Task 4:

$$d = (1 + 3) \times (0 + 9) \times (2 + 0 + 0 + 1)$$

$$d = (4) \times (9) \times (3)$$

$$d = 108 \text{ cm}^2$$

FACTORISE

$$108 = (2x - 7) \times 3x + (3x + 4) \times (x)$$

$$= 6x^2 - 21x + 3x^2 + 4x$$

$$\frac{108}{9} = \frac{9x^2}{9} - \frac{17x}{9}$$

$$\frac{12}{1} + \left(\frac{17}{9x2}\right)^2 = x^2 - \frac{17}{9}x + \left(\frac{17}{9x2}\right)^2$$

$$\frac{12}{1} \times 9 + \left(\frac{17}{9x2}\right)^2 \times 9 = x^2 \times 9 - \frac{17}{9}x \times 9 + \left(\frac{17}{9x2}\right)^2 \times 9$$

$$108 + \frac{1156}{9}x^2 = \frac{1237}{9}x^2 - 17x$$

$$108 + \frac{1156}{9}x^2 - \left(\frac{1237}{9}x^2 - 17\right) = \frac{1237}{9}x^2 - 17x - \left(\frac{1237}{9}x^2 - 17\right)$$

$$108 - 9x^2 + 17x = 0$$